

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A semiconductor device comprising:
 - a first hydrogen barrier film formed over a substrate;
 - a capacitive lower electrode formed on the first hydrogen barrier film;
 - a first insulating film formed on the first hydrogen barrier film to cover a side of the capacitive lower electrode ~~and have the upper surface of the capacitive lower electrode exposed therefrom;~~
 - a capacitive insulating film comprising ~~made of~~ an insulating metal oxide and formed on ~~across the boundary between~~ the capacitive lower electrode ~~and the first insulating film;~~
 - a capacitive upper electrode formed on the capacitive insulating film;
 - a second insulating film formed on the first insulating film to cover the capacitive insulating film and the capacitive upper electrode ~~and having a sloped portion at a position corresponding to an edge of the capacitive upper electrode; and~~
 - a second hydrogen barrier film formed on the second insulating film,
 - wherein a lower surface of the capacitive insulating film is in contact with the first insulating film.
2. (Currently amended) A semiconductor device comprising:
 - a first hydrogen barrier film formed over a substrate;
 - a capacitive lower electrode formed on the first hydrogen barrier film;
 - a first insulating film formed on the first hydrogen barrier film to cover a side of the capacitive lower electrode ~~and have the upper surface of the capacitive lower electrode exposed therefrom;~~

a capacitive insulating film comprising ~~made of~~ an insulating metal oxide and formed on
~~across the boundary between the capacitive lower electrode and the first insulating film;~~

a capacitive upper electrode formed on the capacitive insulating film;

a second insulating film formed on the first insulating film to cover the capacitive
insulating film and the capacitive upper electrode;

a third insulating film ~~made of a different material from that of the second insulating film,~~
formed to cover the second insulating film, ~~and rounded by reflowing in a portion corresponding~~
~~to an edge of the capacitive upper electrode; and~~

a second hydrogen barrier film formed on the third insulating film,

wherein a lower surface of the capacitive insulating film is in contact with the first
insulating film.

3. (Currently amended) The semiconductor device of claim 1 [[or 2]], wherein the
capacitive insulating film comprises a ferroelectric film, and capacitor constituted by

the capacitive lower electrode, the capacitive insulating film and the capacitive upper
electrode are ~~is completely~~ covered with the first and second hydrogen barrier films.

4. (Currently amended) The semiconductor device of claim 1 [[3]], wherein a side ~~the~~
~~first and second insulating films are formed into an island shape and the periphery of the first~~
hydrogen barrier film is connected to ~~the bottom of the second hydrogen barrier film so that~~ the
capacitive lower electrode, the capacitive insulating film and the capacitive upper electrode are
~~the ferroelectric capacitor is completely~~ covered with the first and second hydrogen barrier films.

5. (Currently amended) The semiconductor device of claim 1 [[or 2]], wherein the
capacitive lower electrode comprises ~~is made of~~ a multilayer film in which [[a TiN film,]] a
TiAlN film, an Ir film, an IrO₂ film and a Pt film are stacked in this order.

6. (Currently amended) The semiconductor device of claim 2, wherein the third insulating film comprises ~~is formed with an ozone CVD process and made of~~ an undoped silicon oxide film or a silicon oxide film doped with at least one of boron or phosphorus.

7. (Currently amended) A method for fabricating a semiconductor device, the method comprising the steps of:

forming a first hydrogen barrier film over a substrate ~~with a protective insulating film interposed therebetween;~~

forming a capacitive lower electrode on the first hydrogen barrier film;

forming a first insulating film on the first hydrogen barrier film so that the first insulating film covers a side of the capacitive lower electrode ~~and the upper surface of the capacitive lower electrode is exposed;~~

forming a capacitive insulating film of an insulating metal oxide on ~~so that the capacitive insulating film covers the boundary between~~ the capacitive lower electrode and the first insulating film;

forming a capacitive upper electrode on the capacitive insulating film;

forming a second insulating film on the first insulating film so that the second insulating film covers the capacitive insulating film and the capacitive upper electrode;

~~forming a sloped portion in the second insulating film at a position corresponding to an edge of the capacitive upper electrode; and~~

forming a second hydrogen barrier film on the second insulating film, ~~having the sloped portion~~

wherein a lower surface of the capacitive insulating film is in contact with the first insulating film.

8. (Currently amended) The method of claim 7, further comprising the step of forming a sloped portion in the second insulating film at a position corresponding to an edge of the capacitive upper electrode, between the step of forming the second insulating film and the step of forming the second hydrogen barrier film,

wherein ~~the step of forming~~ the sloped portion is formed by ~~comprises the step of~~ performing sputtering on the second insulating film with inert ions ~~to form the sloped portion.~~

9. (Currently amended) The method of claim 7, further comprising ~~wherein~~ the step of forming ~~a the~~ sloped portion ~~comprises the step of~~ in the second insulating film at a position corresponding to an edge of the capacitive upper electrode, between the step of forming the second insulating film and the step of forming the second hydrogen barrier film,

wherein the sloped portion is formed by etching the entire surface of the second insulating film ~~to form the sloped portion.~~

10. (Currently amended) The method of claim 7 ~~any one of claims 7 to 9~~, further comprising:

the step of forming a sloped portion in the second insulating film at a position corresponding to an edge of the capacitive upper electrode, between the step of forming the second insulating film and the step of forming the second hydrogen barrier film; and

the step of selectively etching the second insulating film and the first insulating film to form the second insulating film and the first insulating film into an island shape, between the step of forming the sloped portion and the step of forming the second hydrogen barrier film,

wherein the step of forming the second hydrogen barrier film comprises the step of connecting a side ~~the periphery~~ of the first hydrogen barrier film and ~~the bottom of~~ the second hydrogen barrier film to each other so that ~~a ferroelectric capacitor constituted by~~ the capacitive

lower electrode, the capacitive insulating film and the capacitive upper electrode are is completely covered with the first and second hydrogen barrier films.

11. (Currently amended) A method for fabricating a semiconductor device, the method comprising the steps of:

forming a first hydrogen barrier film over a substrate ~~with a protective insulating film interposed therebetween;~~

forming a capacitive lower electrode on the first hydrogen barrier film;

forming a first insulating film on the first hydrogen barrier film so that the first insulating film covers a side of the capacitive lower electrode and the upper surface of the capacitive lower electrode is exposed;

forming a capacitive insulating film of an insulating metal oxide on ~~so that the capacitive insulating film covers the boundary between~~ the capacitive lower electrode and the first insulating film;

forming a capacitive upper electrode on the capacitive insulating film;

forming a second insulating film on the first insulating film so that the second insulating film covers the capacitive insulating film and the capacitive upper electrode;

forming ~~[[.]]~~ a third insulating film on the second insulating film, ~~a third insulating film made of a different material from that of the second insulating film;~~

~~performing a reflowing process on the third insulating film so that a portion of the third insulating film corresponding to an edge of the capacitive upper electrode is rounded; and~~

forming a second hydrogen barrier film on the third insulating film ~~having the rounded portion corresponding to the edge of the capacitive upper electrode,~~

wherein a lower surface of the capacitive insulating film is in contact with the first

insulating film.

12. (Original) The method of claim 11, wherein the step of forming the third insulating film comprises the step of performing an ozone CVD process to form the third insulating film made of an undoped silicon oxide film or a silicon oxide film doped with at least one of boron and phosphorus.

13. (Currently amended) The method of claim 11 [[or 12]], further comprising:
the step of performing a reflowing process on the third insulating film so that a portion of the third insulating film corresponding to an edge of the capacitive upper electrode is rounded, between the step of forming the third insulating film and the step of forming the second hydrogen barrier film; and

the step of selectively etching the third insulating film, the second insulating film and the first insulating film to form the third insulating film, the second insulating film and the first insulating film into an island shape, between the step of performing the reflowing process on the third insulating film and the step of forming the second hydrogen barrier film,

wherein the step of forming the second hydrogen barrier film comprises the step of connecting a side ~~the periphery~~ of the first hydrogen barrier film and the bottom of the second hydrogen barrier film to each other so that ~~a ferroelectric capacitor constituted by the capacitive lower electrode, the capacitive insulating film and the capacitive upper electrode is completely~~ are covered with the first and second hydrogen barrier films.

14. (Currently amended) The method of claim 7 [[or 11]], wherein the capacitive lower electrode comprises ~~is made of~~ a multilayer film in which [[a TiN,] a TiAlN film, an Ir film, an IrO₂ film and a Pt film are stacked in this order.

15. (New) The semiconductor device of claim 1, wherein the size of the capacitive

insulating film is larger than that of the capacitive lower electrode.

16. (New) The semiconductor device of claim 1, wherein the upper surface of the capacitive lower electrode is flush with the upper surface of the first insulating film.

17. (New) The semiconductor device of claim 1, further comprising a conductive film formed between the first hydrogen barrier film and the capacitive lower electrode.

18. (New) The semiconductor device of claim 17, wherein the conductive film comprises TiN.